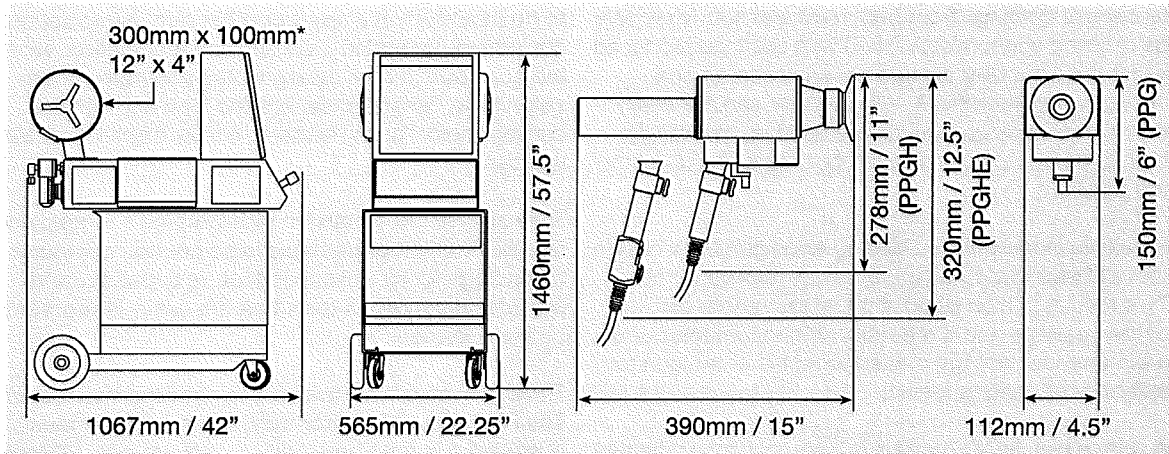


SULZER**Sulzer Metco****4 Technical Data****4.1 Dimensions****4.2 Specifications**

350RU Power Supply			
Input Amperage	82 / 72 / 41 / 36	A	
Input Voltage	208 / 230 / 400 / 460	VAC	
Input Frequency	50 / 60	Hz	
Output Voltage	10 - 46	VDC	(100% duty cycle)
Output Amperage	80 - 400	A	(100% duty cycle)
Weight	174	kg	
	383	lbs	
Maximum ambient temperature	40°	C	
	104°	F	
PPC Console			
Air Pressure	2.4 - 4.2	bar	
	35 - 60	psi	
Air Flow	58 - 105	m³/h	
	2200 - 4000	ft³/hr	
Weight	132	kg	
	290	lbs	
Gun			
Wire Size*	1.6	mm	hard wire
	14	gauge	
Models (specify when ordering)	PPG	machine-mount, with tool post	
	PPGH	hand-held	
	PPGHE	hand-held, CE-conformant with E-stop	
Weight	6.3	kg	PPG
	14	lbs	
	5.4	kg	PPGH, PPGHE
	12	lbs	

*as equipped at factory; options are available or different configurations

www.sulzermetco.com • info@sulzermetco.com

The Coatings Company™

Sulzer Metco (US) Inc.
1101 Prospect Avenue
Westbury NY 11590
U.S.A.
Tel. +1 516 334 1300
Fax +1 516 338 2414

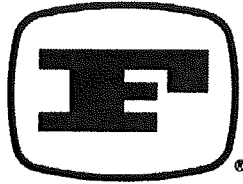
Sulzer Metco (Japan) Ltd.
3-4-2 Hikawadai, Nerima-ku
Tokyo 170-0084
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Tel. +81 359 203 302
Fax +81 359 203 512

Sulzer Metco Europe GmbH
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D-65795 Hattersheim
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Sulzer Metco (Switzerland) AG
Rigackerstrasse 16
CH-5610 Wohlen
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Tel. +41 56 618 81 81
Fax +41 56 618 81 00

Sulzer Metco (Singapore) Pte.Ltd.
2 Loyang Lane
06-02
Singapore 508913
Tel. +65 545 0870
Fax +65 545 0816

Information is subject to change without prior notice.



FARR

Air Pollution Control

Emissions Performance Statement For NxEdge Inc of Boise

Qty 1 Gold Series Filter Dust Collector
Material Filtered: Aluminum Oxide (Thermal Spray)
AC ratio: Not to exceed 2.5:1
Inlet Grain Loading: Not to exceed 10 grains per DSCF

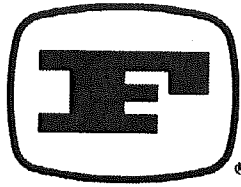
Farr Company warrants that the emissions from the GS24 Dust Collector utilizing Hemipleat Filter Model – HMPTU-325, Part Number - 211497004 (Cellulose / Polyester Media) will not exceed 0.01 gr/dscf in particulate emissions for one year from startup. Farr Company also warrants these filters will provide an efficiency of 99.99% on .5 micron particles (by weight) if operated under normal conditions and a 2.0" w.g. or higher of differential pressure is maintained.

If a verification stack test is to be performed, it must be done at least 30 days after startup, and no more than 90 days after startup. If emissions level is not met, then Farr will be responsible for supplying a higher efficiency filter media to meet emissions level. Farr requests proper notification for any stack test in order to be present at the test. Farr will not be responsible for the costs associated with any stack tests.

The following conditions will apply to this warranty:

- (1) The collectors will be operated per industry standard practices, (Reference Collector Operating Instruction Manual)
- (2) Upset conditions, as defined as excessive oil or hydrocarbons, loss of power to the cleaning system, excessive moisture, abrasion due to improper evacuation of dust collector hopper or exceeding air flow specified, may void this warranty.
- (3) Review of inlet duct design by Farr Company.
- (4) Daily records will be kept on pressure drop across the filters.
- (5) Under no circumstances will Farr Company be responsible for incidental or consequential damages.

Lee Morgan
President



FARR

Air Pollution Control

Emissions Performance Statement For NxEdge Inc of Boise

Qty 1 Gold Series Filter Dust Collector
Material Filtered: Aluminum Oxide (Thermal Spray)
AC ratio: Not to exceed 2.5:1
Inlet Grain Loading: Not to exceed 10 grains per DSCF

Farr Company warrants that the emissions from the GS24 Dust Collector utilizing DuraPleat Filter Model – DPT-200, Part Number - 205637004 (Spun Bond / Polyester PTFE Membrane) will not exceed 0.002 gr/dscf in particulate emissions for one year from startup and it is expected that the emissions should be below 0.001 gr/dscf.

Farr Company also warrants these filters will provide an efficiency of 99.99% on .5 micron particles (by weight) if operated under normal conditions and a 2.0" w.g. or higher of differential pressure is maintained.

If a verification stack test is to be performed, it must be done at least 30 days after startup, and no more than 90 days after startup. If emissions level is not met, then Farr will be responsible for supplying a higher efficiency filter media to meet emissions level. Farr requests proper notification for any stack test in order to be present at the test. Farr will not be responsible for the costs associated with any stack tests.

The following conditions will apply to this warranty:

- (1) The collectors will be operated per industry standard practices, (Reference Collector Operating Instruction Manual)
- (2) Upset conditions, as defined as excessive oil or hydrocarbons, loss of power to the cleaning system, excessive moisture, abrasion due to improper evacuation of dust collector hopper or exceeding air flow specified, may void this warranty.
- (3) Review of inlet duct design by Farr Company.
- (4) Daily records will be kept on pressure drop across the filters.
- (5) Under no circumstances will Farr Company be responsible for incidental or consequential damages.

Lee Morgan
President

PARTICLE SIZE MICRONS	UPSTREAM AVERAGE COUNT	DOWNSTREAM AVERAGE COUNT	PARTICLE SIZE EFFICIENCY
0.3 - 0.4	400816	30	99.993%
0.4 - 0.5	269616	4	99.999%
0.5 - 0.6	147600	1	100.000%
0.6 - 0.8	171872	0	100.000%
0.8 - 1.0	67371	1	99.999%
1.0 - 1.5	88101	0	100.000%
1.5 - 2.0	32078	0	100.000%
2.0 - 3.0	20467	0	100.000%

GRAV.CONC. MG/CU.M	6300.00	0.0032	OVERALL GRAVIMETRIC
GR/CU.FT	2.75	0.0000	EFFICIENCY: 99.9994%

TENKAY GRAVIMETRIC EFFICIENCY

TENKAY, DUST COLLECTOR



> -----Original Message-----
> From: Gautreau, Randy [mailto:GautreauR@farrapc.com]
> Sent: Wednesday, January 02, 2008 1:41 PM
> To: Sherry Jenkins
> Subject: Farr Emissions Performance Statements [Scanned]
>
>
> Best Regards,
> Randy Gautreau
> Aftermarket Sales
> FARR Air Pollution Control
> 3505 South Airport Road
> Jonesboro, AR 72401
> Toll Free Phone - 800-479-6801 ext. 7136 Direct Phone - 870-910-7136
> Fax
> - 866-639-7151 gautreauR@farrapc.com www.farrapc.com
>
> -----Original Message-----
> From: Hudson, Tim
> Sent: Wednesday, January 02, 2008 1:19 PM
> To: Gautreau, Randy
> Subject: RE: Emissions Performance Statements [Scanned]
>
> Randy,
> Please forward to Sarah and Sherry.
>
> On the GS20 (622753-A), with the change to the Hemipleat Cartridges
> from the original collector supplied, original Air to Cloth was .85 to

> 1, Outlet CFM still at 7200 CFM. New ACR is 1.107 to 1. Emissions
> still as stated on statement supplied.
> --> Additional comment: Using Teflon coated Spun Bond Polyester
> DPT-200 - 205637004 cartridges (Gortex), the ACR changes to 1.8 to 1.
>
> On the GS24 (641647-C), with the change to Hemipleat Cartridges from
> the original collector supplied, original ACR of .49 to 1 (24
> cartridges used), Outlet CFM at 5000 CFM, New ACR of .769 to 1 (based
> on 20 cartridges and 4 blanks). Emissions should be within warrantee
> statement. (4 blanks should not be a problem, due to original sizing
> was low enough)
> --> Additional comment: Using Teflon coated Spun Bond Polyester
> --> DPT-200
> - 205637004 cartridges (Gortex), the ACR changes to 1.25 to 1.
>
> On the GS16 (669747-B), this was designed and supplied with Hemipleat
> Cartridges, outlet CFM at 7200 CFM, ACR on drawing is incorrect.
> Should be an ACR of 1.38 to 1 vs. 1.06 to 1. This should not effect
> the emissions stated.
>
> No where do I see anything listed on these drawings or orders that
> Teflon coated Spun Bond Polyester DPT-200 - 205637004 cartridges are
> being used. If these are being used in any of the above listed
> collectors, this will adversely change the ACR ratings as I have
> listed.
>
> Please keep a copy of these drawings with a copy of this Email on file

> for your future reference.
>
> Thank you,
> Tim Hudson
> Tech. Services Mgr.
> Farr APC
> Phone - 870-910-7117
> Fax - 870-933-8381
>
> _ _ _ Confidentiality Notice: _ _ _ _ _
>
> This eMail and any accompanying document(s) contain confidential and
> privileged information from Camfil Farr and receipt is intended solely
> for the use of the individual or entity named in this transmission.

Gen 5/
FARR 2

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<http://www.google.com/custom?q=cache:s21jAxZA85wJ:www.arb.ca.gov/regact/thermspr/appc.doc+plasma+spray&hl=en&ct=clnk&cd=7&gl=us&client=google-coop-np>

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These search terms have been highlighted: **plasma spray**

Appendix C

Methodology for Estimating Hexavalent Chromium Emissions from Thermal Spraying

C.1. Introduction

Hexavalent chromium emissions from thermal spraying can be estimated by direct measurement of facility exhaust gases or by performing calculations based on material usage. Measurement of exhaust gases is generally the preferred method for individual facilities, but conducting stack exhaust tests can be costly. Therefore, we have developed calculation methods that can be used to estimate hexavalent chromium emissions for different types of thermal spraying processes and the associated air pollution control devices. The following sections describe the process that was used to develop emission estimation methods for thermal spraying.

C.2. Hexavalent Chromium Fumes from Thermal Spraying

Hexavalent chromium and hexavalent chromium compounds are classified as toxic air contaminants, but hexavalent chromium compounds are not generally present in thermal spraying materials as a raw ingredient. The types of chromium that are listed as ingredients include:

- Chromium CAS # 7440-47-3
- Chromium +3 CAS # 16065-83-1
(trivalent)
- Chromium Oxide CAS # 1308-38-9

Even though hexavalent chromium compounds are not originally present in thermal spraying materials, numerous stack tests have measured emissions of hexavalent chromium from thermal spraying facilities. This indicates that a conversion occurs during the thermal spraying process to change chromium from an elemental or trivalent state to a hexavalent state. A supplier of thermal spraying materials has found that hexavalent chromium may be produced when materials are exposed to the high temperatures that are involved in many thermal spraying processes (Praxair, 2002). In addition, a thermal spraying industry report states that vaporized metallic chromium can cause a small fraction of

the chromium to oxidize and form chromates that contain a hexavalent form of chromium (Smith, 1994). This conversion to hexavalent chromium was measured during Sawatari's study of a **plasma** metal spraying process with chromium metal (Sawatari, 1986). Researchers used a METCO 7MC **plasma** metal sprayer and 99.9% chromium powder to generate fumes that were then analyzed to determine the hexavalent chromium content. Total chromium was determined with an atomic absorption spectrometer. Hexavalent chromium was determined by the colorimetric method, using an ultraviolet-visible (UV-Vis) spectrophotometer. Results indicated that metallic chromium was undetectable in the fumes (less than 0.5% of the total), but the fumes did contain 30% hexavalent chromium compounds as shown in Table C-1.

Table C-1: <i>Chromium Compounds in Plasma Spraying Fumes</i>			
Name of Compound	CAS #	MW*	% of Total
Dichromium Trioxide (Cr_2O_3) [corundum structure]	1308-38-9	152	25%
Chromium (VI) Trioxide (CrO_3)	1333-82-0	100	3%
Mixed Oxide Fraction Containing:			
Dichromium (III) Trioxide (Cr_2O_3)	1308-38-9	152	45%
Chromium (VI) Trioxide (CrO_3)	1333-82-0	100	27%
		Total =	100%

*MW = Molecular Weight, grams/mole

In another study, researchers used a **plasma** spraying gun to generate metal fumes from chromium powder. Total chromium was determined with an atomic absorption spectrometer. Hexavalent chromium was determined by the colorimetric method, using an ultraviolet-visible (UV-Vis) spectrophotometer. Chemical analysis determined that 26.4% of the total chromium was hexavalent and the residue was trivalent (Serita, 1990). These results are consistent with the values obtained from Sawatari's study.

The California Occupational Safety and Health Administration (Cal/OSHA) conducted additional research on **plasma** spraying activities (Gold, 2000). They conducted personal air sampling during two days of **plasma** spraying activities and measured the concentrations of hexavalent chromium, total chromium, and nickel. Hexavalent chromium was measured using the following analytical methods: NIOSH 7600 (visible absorption spectrophotometry), NIOSH 7604 (ion chromatography conductivity detection), and OSHA 215 (ion chromatography with UV-Vis detector). For the first day, the hexavalent chromium concentration was 0.074 mg/m^3 for two different samples, while the total chromium concentration was 0.110 mg/m^3 for one sample and 0.230 mg/m^3 for the other sample. On the second day, hexavalent chromium levels were much higher, measuring 0.646 mg/m^3 for one sample and 7.230 mg/m^3 for the other sample, while total chromium was 10.172 mg/m^3 and 27.258 mg/m^3 , respectively. Based on these results, it is possible to estimate the percentage of total chromium that is in the hexavalent form (e.g., $0.074 / 0.110 \text{ mg/m}^3 = 67\%$). The average percentage of hexavalent chromium is 33%, which is consistent with the results from the Sawatari and Serita studies.

Hexavalent chromium emissions were also measured during a NIOSH Health Hazard Evaluation at a thermal spraying facility (NIOSH, 1989). Air samples were collected while workers conducted electric arc spraying with wires made of stainless steel, bronze, and alcro (aluminum, chromium, and iron). These samples were analyzed for a variety of metals, including hexavalent chromium, total chromium, and nickel. Hexavalent chromium was measured using the analytical method of NIOSH 7600 (visible absorption spectrophotometry.) During twelve sampling events, hexavalent chromium was detected in concentrations ranging from 0.12 to 0.34 mg/m^3 at the face of the ventilation hood. Total chromium

concentrations ranged from 1.82 to 2.22 mg/m³ and the average percentage of hexavalent chromium was 11%. These results confirm that hexavalent chromium is generated during electric arc spraying, but the percentage of hexavalent chromium in the fumes is lower than has been measured for **plasma** spraying. This may be because **plasma** spraying generates much higher temperatures and particle velocities than electric arc spraying.

As these studies demonstrate, the formation of hexavalent chromium during thermal spraying has been documented for a variety of sources, but the quantities that are emitted can vary widely, depending on the type of process and the type of control device. Some stack tests have found that more than 90% of the total chromium being measured consists of hexavalent chromium, while other tests have found less than 5%. The most conservative approach for estimating statewide emissions would be to assume maximum conversion to hexavalent chromium and complete consumption of all materials sold in California during 2002. However, ARB staff has developed a method that involves estimating emissions by compiling data from a variety of sources and a range of control devices. The following sections describe the different sources that were used to develop emission factors and estimate hexavalent chromium emissions on an annual basis and an hourly (average and maximum) basis.

C.2.1. Particle Sizes

Emissions and control device efficiencies are dependent on the size of the particles that are generated by thermal spraying processes. Some research has been done to measure particle sizes for thermal spraying processes and the results indicate that particle diameters can range from less than one micron to more than 100 microns. In Serita's study, fume particles from a **plasma** spraying gun were examined with a scanning electron microscope. The mass median aerodynamic diameter and the geometric standard deviation of the chromium fumes were 2.1 um and 2.00 um, respectively. Those of the nickel fumes were 3.7 um and 1.74 um, respectively (Serita, 1990). Chadwick's study also used a scanning electron microscope to examine fume particulate generated by electric arc, **plasma** and detonation gun spraying. This study found that particles were of two distinct types: crystalline/angular particles with diameters from 5 um to 20 um and smaller spherical particles ranging from <1 um to 10 um. Both **plasma** and detonation gun spraying produced a high proportion of particles with a diameter <2 um (Chadwick, 1997.) Both Chadwick's and Serita's studies indicate that metal fumes from thermal spraying contain a large portion of particles that are less than 5 um. We also found data on the "dust" that is generated by thermal spraying. Table C-2 contains particle size distributions for a variety of thermal spraying processes and the results indicate that 90% of the dust particles are larger than 5 microns (Smith, 1994). The analytical method that was used to measure these particles was not provided.

Table C-2:						
<i>Typical Particle Size Distributions in Dust of Thermal Spray Processes</i>						
Process	1 um	>1-5 um	5-10 um	10-50 um	50-100 um	>100 um
Flame/Wire Metallizing	2	8	10	20	40	20
Wire-Arc (Zinc)	-	1	2	21	-	76
Wire-Arc (Aluminum)	10	-	3	-	87	-
Powder/Flame	1	9	20	30	30	10
HVOF	1	9	30	55	5	-
Plasma	3	7	30	40	20	-

(Smith, 1994)

C.3. Hexavalent Chromium Emission Factors - Summary

The general approach for estimating emissions involves multiplying emission factors by usage rates. Emission factors were obtained from a variety of sources, based on the type of process, the form of material being used (i.e., powder or wire), and the type of control device. In some cases, emission factors were taken directly from stack test results, while other factors were derived from a combination of stack test results, research data, and data on control efficiencies. Table C-3 summarizes the emission factors that were used and Section C.4 describes how these factors were derived.

Table C-3:**Emission Factor Summary – Hexavalent Chromium**

Process	Emission Factors (lbs Cr ⁺⁶ /lb Cr sprayed)			
	0% Ctl. Eff. (Uncontrolled)	90% Ctl. Eff. ¹ (e.g. Water Curtain)	99% Ctl. Eff. (e.g. Dry Filter)	99.97% Ctl. Eff. (e.g., HEPA Filter)
Single-Wire Flame Spray ²	4.68E-03	4.68E-04	4.68E-05	1.40E-06
Twin-Wire Electric Arc Spray ²	6.96E-03	6.96E-04	6.96E-05	2.09E-06
Flame Spray ³	6.20E-03	1.17E-03	6.20E-05	1.86E-06
HVOF ³	6.20E-03	1.17E-03	6.20E-05	1.86E-06
Plasma Spray ⁴	1.18E-02	6.73E-03	2.61E-03	2.86E-06
Other Thermal Spraying ⁵	7.17E-03	2.05E-03	5.70E-04	2.01E-06

1. Listed below the control efficiencies are examples of control devices that may meet the control efficiency.

2. Emission factors based on Battelle study.

3. Emission factors based on SDAPCD stack test data for flame spraying.

4. Emission factors based on stack test results compiled by CATEF, SCAQMD, and SDAPCD.

5. For "Other Thermal Spraying" processes, we used an average of the emission factors for the listed thermal spraying processes.

C.4. Emission Factor Development

The following sections describe how emission factors are derived from various sources for different types of thermal spraying processes and control devices. In each case, emission factors are developed for operations that had no air pollution control devices (i.e., uncontrolled) and for operations that had control devices (i.e., controlled).

C.4.1. Emission Factors: Flame Spraying & Electric Arc Spraying with Wire

Emission factors for wire spraying are based on a study that was conducted by Battelle for the American Welding Society. The study was primarily focused on measuring fumes from welding, but it also included using an enclosed fume collection chamber to measure the quantities of fumes generated by combustion flame spraying with stainless steel wire, and twin-wire electric arc spraying with stainless steel wire (AWS, 1979.) Results of the study are summarized in Table C-4.

Table C-4:**Fume Generation Rates - Flame Spraying & Electric Arc Spraying with Wire**

Material Safety Data Sheet

SULZER

Sulzer Metco

Section 1. Chemical Product and Company Identification

Product name Metco 54, 54NS, 54NS-1, Sulzer Metco 4009, XPT-D009, AE 7906
Supplier **SULZER METCO (US) INC.**
 1101 Prospect Avenue
 Westbury, NY 11590-0201
 Phone: (516) 334-1300
Emergency Phone: CHEMTREC 800-424-9300
Calls Outside the United States: 202-483-7616
Material Uses Metal industry: Used by Spraying

Section 2. Composition, Information on Ingredients

Name	CAS #	% by Weight	Exposure Limits
Aluminium	7429-90-5	99-100	ACGIH TLV (United States, 2002). TWA: 2 mg/m ³ TWA: 10 mg/m ³ Form: Dust TWA: 5 mg/m ³ Form: Fume NIOSH REL (United States, 2001). TWA: 5 mg/m ³ Period: 10 hour(s). Form: Respirable fraction TWA: 10 mg/m ³ Period: 10 hour(s). Form: Total TWA: 5 mg/m ³ Period: 10 hour(s). OSHA PEL 1989 (United States, 1989). TWA: 15 mg/m ³ Form: Dust TWA: 5 mg/m ³ Form: Pyrophoric TWA: 5 mg/m ³ Form: Respirable fraction TWA: 5 mg/m ³ Form: Welding fume

Section 3. Hazards Identification

Physical State and Appearance Powder.

Emergency Overview **WARNING!**
 CONTAINS MATERIAL WHICH CAUSES DAMAGE TO THE FOLLOWING ORGANS: RESPIRATORY TRACT, SKIN, EYE, LENS OR CORNEA.

Routes of Entry Not available.

Potential Acute Health Effects
Eyes Prolonged or repeated exposure to even very small quantities may be irritating (redness, tears and pain).
Skin May cause skin sensitization.
Inhalation Prolonged or repeated inhalation may be irritating (depressed respiration, coughing and sore throat).
Ingestion Not available.

Potential Chronic Health Effects
Carcinogenic Effects Classified None. by NIOSH [aluminium].

Medical Conditions Aggravated by Overexposure: Repeated or prolonged exposure is not known to aggravate medical condition.

METCO54	MSDS#	50-118
Date of issue 7/21/2003	Print Date 7/31/2003	Prepared by Sulzer Metco (US) Inc.



Get the most comprehensive
MSDS/HazCom program on the market!

Material Safety Data Sheet

SECTION I - Material Identity
SECTION II - Manufacturer's Information
SECTION III - Physical/Chemical Characteristics
SECTION IV - Fire and Explosion Hazard Data
SECTION V - Reactivity Data
SECTION VI - Health Hazard Data
SECTION VII - Precautions for Safe Handling and Use
SECTION VIII - Control Measures
SECTION IX - Label Data
SECTION X - Transportation Data
SECTION XI - Site Specific/Reporting Information
SECTION XII - Ingredients/Identity Information

SECTION I - Material Identity

Item Name	
Part Number/Trade Name	LIME HYDRATED TYPE S
National Stock Number	5610002426012
CAGE Code	ODGV3
Part Number Indicator	A
MSDS Number	11750
HAZ Code	B

SECTION II - Manufacturer's Information

Manufacturer Name	CHEMSTAR INC
P.O. Box	127
Street	BMI COMPLEX OFF LAKE MEAD RD
City	HENDERSON
State	NV
Country	US
Zip Code	89005
Emergency Phone	800-424-9300
Information Phone	702-565-8991

MSDS Preparer's Information

SECTION X - Transportation Data

Container Quantity	50
Unit of Measure	LB

SECTION XI - Site Specific/Reporting Information

Volatile Organic Compounds (P/G)	0
Volatile Organic Compounds (G/L)	0

SECTION XII - Ingredients/Identity Information

Ingredient #	01
Ingredient Name	CALCIUM HYDROXIDE
CAS Number	1305620
Proprietary	NO
Percent	> 50
OSHA PEL	5 MG/M3
ACGIH TLV	5 MG/M3
Ingredient #	02
Ingredient Name	MAGNESIUM HYDROXIDE
CAS Number	1309428
Proprietary	NO
Percent	35
Ingredient #	03
Ingredient Name	CALCIUM CARBONATE
CAS Number	1317653
Proprietary	NO
Percent	< 5
OSHA PEL	15 MG/M3
ACGIH TLV	15 MG/M3
Ingredient #	04
Ingredient Name	MAGNESIUM OXIDE
CAS Number	1309484
Proprietary	NO
Percent	< 5
OSHA PEL	15 MG/M3
ACGIH TLV	15 MG/M3
Ingredient #	05
Ingredient Name	SILICA
CAS Number	14808607
Proprietary	NO
Percent	< 1
OSHA PEL	0.1 MG/M3

SERIAL NUMBER: **ME14P-001**

PAGE 1 OF 4

REVISED May 22, 2006

MATERIAL SAFETY DATA SHEET

This form may be used to comply with OSHA's Hazard Communication Standard, 29 CFR 1910.1200.

IDENTITY (As Used on Label and List): **SILICON, POWDERS AND PIECES****SECTION I - PRODUCT IDENTIFICATION****Silicon, powder and pieces**

Product Details: Silicon powders and pieces

Stock Number: ME14P

Manufacturer/Supplier:

Stanford Materials Corporation

4 Meadowpoint, Aliso Viejo, CA 92656, USA

Tel: (949) 362-1746, Fax: (949) 362-1810

<http://www.stanfordmaterials.com>UPC/EAN: 231-130-8SYNONYMS SiliconCHEMICAL FAMILY: Non-metalDOT HAZARD LABEL: No data.FORMULA: SiMOLECULAR WEIGHT: 28.09**SECTION II - HAZARDOUS INGREDIENTS/IDENTITY INFORMATION****Silicon, powder and pieces**HAZARDOUS COMPONENTS (CHEMICAL NAME)

<u>NAME</u> :	Silicon		
<u>CAS #</u> :	7440-21-3	<u>PERCENTAGE</u> :	0.0 -100.0 %
<u>OSHA PEL</u> :	15 mg/m3	<u>ACGIH TLV</u> :	10 mg/m3
<u>OTHER LIMITS</u> :	5mg/m3 resp		
<u>SEC.302 (EHS)</u> :	No	<u>SEC.304 RQ</u> :	No
<u>SEC.313</u> :	No		

SECTION III - PHYSICAL/CHEMICAL CHARACTERISTICS**Silicon, powder and pieces**

<u>PHYSICAL STATES</u> :	<input type="checkbox"/> Gas , <input type="checkbox"/> Liquid , <input checked="" type="checkbox"/> Solid
<u>BOILING POINT</u> :	2355.00 C (4271.0 F) to 2600.00 C (4712.0 F)
<u>MELTING POINT</u> :	1410.00 C (2570.0 F) to 1420.00 C (2588.0 F)
<u>SPECIFIC GRAVITY (WATER = 1)</u> :	2.33 gm/cc at 25.0 C (77.0 F)
<u>DENSITY</u> :	No data.
<u>VAPOR PRESSURE (VS. AIR OR MM HG)</u> :	1 mm at 1724.0 C (3135.2 F)

Nathan Trotter & Co.

Material Safety Data Sheet

STS Area MSDS
Tin Wire

Section 1 Identification

Product Name:	Tin Metal	Health:	0
Chemical Family:	Metal	Flammability	0
Formula:	Sn	Reactivity	0
RTECS:	XP7320000	Hazard Scale:	
C.A.S	CAS# 7440-31-5	Least Slight Moderate High Extreme	0 1 2 3 4
		NA = Not Applicable NE = Not Established	

Section 2 Component Mixture

	Component	CAS Number	%	Dim	Exposure Limits:
<input checked="" type="checkbox"/>	Tin Metal	CAS# 7440-31-5	100%	W/W	OSHA PEL 2 mg/mf

Section 3 Hazard Identification (Also see section 1.1)

Generally not hazardous in normal handling, however good laboratory practices should always be used. Avoid long term exposure to skin or by inhalation.

Section 4 First Aid Measures

Generally not hazardous in normal handling, however good laboratory practices should always be used. Avoid long term exposure to skin or by inhalation.

FIRST AID: SKIN: Wash exposed area with soap and water. If irritation persists, seek medical attention.

EYES: Wash eyes with plenty of water for at least 15 minutes, lifting lids occasionally. Seek Medical Aid. INHALATION: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen

INGESTION: Give several glasses of milk or water. Vomiting may occur spontaneously, but it is not necessary to induce. Never give anything by mouth to an unconscious person.

Section 5 Fire Fighting Measures

Fire Extinguisher Type:	Special powder or dry sand. Do not use water!
Fire/Explosion Hazards:	Dust at sufficient concentrations can form explosive mixtures with air.
Fire Fighting Procedure:	Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and clothing.

The information contained herein is believed to be accurate and is offered in good faith for the user's consideration and investigation. No warranty is expressed or implied regarding the completeness or accuracy of this information, whether originating from Nathan Trotter & Co., Inc. or from an alternate source. Users of this material should satisfy themselves by independent investigation of current scientific and medical information that this material may be safely handled.

Section 6 Accidental Release Measures

Sweep up and place in suitable (fiberboard) containers for reclamation or later disposal.

Section 7 Handling and Storage

Store in a cool dry well ventilated area. Keep away from heat and flame. Do not get in eyes, on skin, or on clothing.

Section 8 Exposure Controls & Personal Protection

Respiratory Protection: NIOSH approved dust mask

Mechanical:	Hand Protection:	Gloves to prevent skin exposure as latex or vinyl
Ventilation:	Eye Protection:	Splash Goggles
Local Exhaust:		

Other Protective Equipment: Wear appropriate

Section 9 Physical and Chemical Properties

Melting Point:	232° C	Specific Gravity	7.31
Boiling Point:	2507° C	Percent Volatile by Volume:	0
Vapor Pressure:	1 @ 1609° C	Evaporation Rate:	N/A
Vapor Density:	Information not available	Evaporation Standard:	
Solubility in Water:	Insoluble	Auto ignition Temperature:	Not applicable
Appearance and Odor:	Silvery granules, bars, or mossy flakes	Lower Flamm. Limit in Air:	Not applicable
Flash Point:	N/A	Upper Flamm. Limit in Air:	Not applicable

Section 10 Stability and Reactivity Information

Stability:	Stable	Conditions to Avoid:	Moisture
Materials to Avoid:	Halogens, halogen trifluorides, sulfur, potassium peroxide, acids		
Hazardous Decomposition Products:	None		
Hazardous Polymerization:	Will Not Occur		
Condition to Avoid:	None known		

Section 11 Additional Information

Effects of overexposure, Acute and Chronic: No effects expected to skin. May cause mechanical abrasion to eyes. Prolonged inhalation of dust or fume may result in a benign pneumoconiosis, producing distinctive changes in the lungs with no apparent disability or complications. Conditions aggravated/target organs: Persons with pre-existing eye, skin or respiratory conditions may be more susceptible.

DOT Classification: Not Regulated

DOT regulations may change from time to time. Please consult the most recent version of the relevant regulations.

Revision No:1 Date Entered: 12/13/06 Approved by: LME

Material Safety Data Sheet

SULZER

METCO: 204NS, 204B-NS, 204C-NS, 204NS-1, 204NS-G, 204AF, 204F, 204AP, 204NS-T, SP 11151, SP 12461, SP 12625, SPM 2000, SPM 2000-1, SPM 6-2193B, SPM 6-2499, SULZER METCO 6600, 6606, AMDRY 6643, 204NS-1, ZYGUARD 204B, ZYGUARD 204B-NS, ZYGUARD 204NS, ZYGUARD 204NS-G, ZYGUARD 204F-NS, ZYGUARD 2000, ZYGUARD 204AF, ZYGUARD 204C-NS, SPM 6-2725, AE 9281, AE 9284, AE 9291, AE 9292, AE 9296, AE 9296F, AE 9301, AE 9302, AE 9303, AE 9306, METCO 6613, METCO 204NS-G (AC)

Sulzer Metco

1. Product and company identification

Common name : METCO: 204NS, 204B-NS, 204C-NS, 204NS-1, 204NS-G, 204AF, 204F, 204AP, 204NS-T, SP 11151, SP 12461, SP 12625, SPM 2000, SPM 2000-1, SPM 6-2193B, SPM 6-2499, SULZER METCO 6600, 6606, AMDRY 6643, 204NS-1, ZYGUARD 204B, ZYGUARD 204B-NS, ZYGUARD 204NS, ZYGUARD 204NS-G, ZYGUARD 204F-NS, ZYGUARD 2000, ZYGUARD 204AF, ZYGUARD 204C-NS, SPM 6-2725, AE 9281, AE 9284, AE 9291, AE 9292, AE 9296, AE 9296F, AE 9301, AE 9302, AE 9303, AE 9306, METCO 6613, METCO 204NS-G (AC)

Material uses : Metal industry: Used by spraying

Supplier : Sulzer Metco (US) Inc.
1101 Prospect Avenue
Westbury, NY 11590

Telephone no. : (516) 334 - 1300 (7:30AM - 4:00PM)

Emergency Phone : CHEMTREC 800-424-9300

Calls Outside the United States : +1 202-483-7616 (USA) 24 hour Chemtrec International Emergency Response Service

2. Hazards identification

OSHA/HCS status : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Emergency overview

Physical state : Solid. [Powder.]

Color : White.

Odor : Odorless.

Health hazards : Warning!

CONTAINS MATERIAL WHICH CAUSES DAMAGE TO THE FOLLOWING ORGANS:
RESPIRATORY TRACT, SKIN.

Potential acute health effects

Routes of entry : Inhalation, Ingestion, Skin contact, Eye contact

Eyes : Moderately irritating to eyes.

Skin : Exposure to high concentrations may result in health complaints. Prolonged or repeated exposure may be irritating (redness, pain).

Inhalation : Exposure to high concentrations may result in health complaints. Irritating to respiratory system. Exposure may result in depressed respiration, coughing, nausea and sore throat. Prolonged or repeated exposure to large amounts may cause damage to lungs (lung edema).

Ingestion : Prolonged or repeated exposure may be irritating to mouth, throat and esophagus (sore throat, nausea).

Medical conditions aggravated by over-exposure : Repeated or prolonged exposure to the substance can produce target organs damage.

Environmental effects : No known significant effects or critical hazards.

Date of issue
11/29/2007

MSDS#
50-149

Prepared by
Sulzer Metco

Page: 1/8

METCO: 204NS, 204B-NS, 204C-NS, 204NS-1, 204NS-G, 204AF, 204F, 204AP, 204NS-T, SP 11151, SP 12461, SP 12625, SPM 2000, SPM 2000-1, SPM 6-2193B, SPM 6-2499, SULZER METCO 6600, 6606, AMDRY 6643, 204NS-1, ZYGUARD 204B, ZYGUARD 204B-NS, ZYGUARD 204NS, ZYGUARD 204NS-G, ZYGUARD 204F-NS, ZYGUARD 2000, ZYGUARD 204AF, ZYGUARD 204C-NS, SPM 6-2725, AE 9281, AE 9284, AE 9291, AE 9292, AE 9296, AE 9296F, AE 9301, AE 9302, AE 9303, AE 9306, METCO 6613, METCO 204NS-G (AC)

3. Composition/information on ingredients

<u>Ingredient name</u>	<u>CAS Number</u>	<u>% by weight</u>
Zirconium oxide	1314-23-4	87 - 91
Yttrium oxide	1314-36-9	7.5 - 13
Hafnium oxide (HfO ₂)	12055-23-1	0.1 - 1.8

4. First aid measures

- Eye contact** : Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Get medical attention if irritation occurs.
- Skin contact** : Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Continue to rinse for at least 10 minutes. Get medical attention if symptoms occur. Wash clothing before reuse. Clean shoes thoroughly before reuse.
- Inhalation** : Move exposed person to fresh air. Keep person warm and at rest. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.
- Ingestion** : Wash out mouth with water. Remove dentures if any. Move exposed person to fresh air. Keep person warm and at rest. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

5. Fire-fighting measures

- Auto-ignition temperature** : Not applicable.
- Flash point** : Not applicable.
- Flammable limits** : Not available.

Extinguishing media

- Suitable** : Use an extinguishing agent suitable for the surrounding fire.
- Not suitable** : None known.
- Special exposure hazards** : No specific hazard.
- Hazardous thermal decomposition products** : Not applicable.
- Special protective equipment for fire-fighters** : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.
- Fire hazards in the presence of various substances** : Non-flammable in the presence of the following materials or conditions: open flames, sparks and static discharge and shocks and mechanical impacts
- Explosion hazards in the presence of various substances** : Non-explosive in the presence of the following materials or conditions: open flames, sparks and static discharge and shocks and mechanical impacts

NxEdge PTC Modification

STS Area MSDS

Zn/Al Wire



Surface Engineering & Alloy Company

2895 46th Avenue North • St. Petersburg, FL 33714 • Toll Free: 888-FOR-ALOY
Phone: 727-528-7998 • Fax: 727-528-7995 • <http://www.surfaceengineering.com>

MATERIAL SAFETY DATA SHEET (MSDS)

Section I - Product Information

Product Form: Wire

Product Identifiers: ZnAl2

Product Description: Zinc W/2% Aluminum Spray Wire

Manufacturer: Surface Engineering and Alloy Company
2895 46th Avenue North
St. Petersburg, FL 33714

Telephone Number: 727-528-7998

Fax Number: 727-528-7995

Date Prepared: July 1, 1996

Section II - Hazardous Ingredients / Exposure Limits

<u>Chemical Identity</u>	<u>CAS No.</u>	<u>OSHA PEL1 (Mg/M)</u>	<u>TLV2 (Mg/M)</u>	<u>Concentration Weight %</u>
Zinc	7440-66-6	---	1.0 as fume	80-99
Aluminum	7429-90-5	---	10. as dust or oxide	0-16.5
Cadmium	7440-43-9	---	.05 as dust or fume	0-.005
Copper	7440-50-8	---	.2 as fume	0-.75
Iron	7439-89-6	---	5.0 as fume	0-.75
Lead	7439-92-1	---	.05 as dust or fume	0-.007
Titanium	7440-32-6	---	10. as Dioxide	0-.002

Section III - Physical / Chemical Characteristics

Melting Point 710-1200 degrees F

Boiling Point N/A

Color Bluish White to Silver

Specific Gravity (H2O=1) 2.5—8.5

Vapor Pressure N/A

No Odor

Specialists in Wear Resistant Products & Solutions!

RECEIVED 01-29-'07 12:25 FROM- 7275287995

TO- NXEDGE

P001/002



DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline – 1-877-5PERMIT

PERMIT TO CONSTRUCT APPLICATION

Revision 3
03/27/07

Please see instructions on page 2 before filling out the form.

IDENTIFICATION

Company Name: NxEdge, Inc.	Facility Name:	Facility ID No: 001-00202
Brief Project Description:	Facility Equipment and Throughput Modifications	

EMISSIONS UNIT (PROCESS) IDENTIFICATION & DESCRIPTION

1. Emissions Unit (EU) Name:	R&D ROOM (FOR SMALL PARTS COATING)		
2. EU ID Number:	RD1		
3. EU Type:	<input type="checkbox"/> New Source <input type="checkbox"/> Unpermitted Existing Source <input checked="" type="checkbox"/> Modification to a Permitted Source -- Previous Permit #:P-040007 Date Issued: 07/22/2005		
4. Manufacturer:	NXEDGE USING PRAXAIR / SULZER METCO APPLICATORS		
5. Model:	BP400 & SG100 / SMARTARC PPG		
6. Maximum Capacity:	60 & 30.4 LB PER HR / 70 LB PER HR		
7. Date of Construction:	2003		
8. Date of Modification (if any)	AWAITING PTC MODIFICATION APPROVAL- 2Q 2008		
9. Is this a Controlled Emission Unit?	<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes If Yes, complete the following section. If No, go to line 18.		

EMISSIONS CONTROL EQUIPMENT

10. Control Equipment Name and ID:	Cyclone and Filter Assembly- FARR1					
11. Date of Installation:	2003	12. Date of Modification (if any):				
13. Manufacturer and Model Number:	Camfil-Farr Cyclone and GS20 Filter Assembly fitted with high efficiency cartridge filters (20)					
14. ID(s) of Emission Unit Controlled:	RD1					
15. Is operating schedule different than emission units(s) involved?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					
16. Does the manufacturer guarantee the control efficiency of the control equipment?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No (If Yes, attach and label manufacturer guarantee)					
Control Efficiency	Pollutant Controlled					
	PM	PM10	SO ₂	NO _x	VOC	CO
	99.99%	99.99%				

17. If manufacturer's data is not available, attach a separate sheet of paper to provide the control equipment design specifications and performance data to support the above mentioned control efficiency.

EMISSION UNIT OPERATING SCHEDULE (hours/day, hours/year, or other)

18. Actual Operation	48 HRS/WEEK, 50 WEEKS/YR (NON-CONTINUOUS)
19. Maximum Operation	48 HRS/WEEK, 50 WEEKS/YR (NON-CONTINUOUS)

REQUESTED LIMITS

20. Are you requesting any permit limits?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No (If Yes, check all that apply below)
<input type="checkbox"/> Operation Hour Limit(s):	
<input type="checkbox"/> Production Limit(s):	
<input checked="" type="checkbox"/> Material Usage Limit(s):	585 AND 586 FEED TAPS, OVERALL ANNUAL LIMIT
<input type="checkbox"/> Limits Based on Stack Testing	Please attach all relevant stack testing summary reports
<input type="checkbox"/> Other:	
21. Rationale for Requesting the Limit(s):	MEET AAC/AACC & ALLOW FLEXIBILITY FOR TESTING OF SMALL AMOUNTS OF NEW COATINGS

3.4 STS Research and Development Spray Room

The STS Research and Development Spray Room (R&D Room) is used to apply metal powders and wires to small metal parts via the plasma spray and wire arc spray process. Typically, comparatively small quantities of coatings (<5 lbs per day) are applied in the R&D Room. This unit is permitted in the existing PTC. The room itself has undergone no equipment changes. NxEdge requests changes to the permit limits which will allow restricted coating of parts with a variety of coatings. Additionally, in support of new product development, NxEdge would like to have permit flexibility to spray limited quantities of currently unidentified coatings without applying for a permit modification, as long as NxEdge can demonstrate that no air quality standards will be violated.

Depending on the coating material and process operation, several different applicators can be utilized to spray coatings in the R&D Room. Emissions from the R&D Room are controlled via a downstream cyclone and cartridge filter assembly (FARR1) manufactured by Camfil Farr. Previously, FARR1 also controlled emissions from tube preparation and finishing stands and powder recycling equipment. With this modification, FARR1 will be dedicated solely to the R&D Room emissions. The FARR1 filter assembly is a Farr Model GS20 loaded with 20 cartridges. A 7200 CFM rated fan located on the outlet of the filter assembly draws air from the R&D Room through ducting to the cyclone and filter assembly, both located outdoors. The fan discharges horizontally directly above the filter assembly. The emission point, EP-2, is shown on Form PP.

Due to the limited use of R&D Room coatings and the complexity introduced by the variety of applicators and coatings utilized, uncontrolled emissions were not calculated for this emission unit. Air dispersion modeling of the controlled R&D Room emissions is already required due to the facility-wide uncontrolled TAP and particulate emissions, so uncontrolled emission analysis of the R&D Room is not necessary.

Controlled TAP emissions are calculated based on restricting the individual 585 TAP metals to 100 lb/day and the individual 586 TAP metals to 200 lb/year. Controlled emissions also include an emission control equipment efficiency of 99.99 wt%, as certified by the filter manufacturer in the attached certification letter from Farr APC. Based on these proposed permit feed limits and control efficiency, the controlled TAP emission rates for the R&D Room are shown in the TAP Emissions Summary in Table 3.4.

Elemental chromium is present in one of the proposed plasma spray powders for the R&D Room. While hexavalent chromium (Cr(VI)) is not present in the powder, industry stack tests have measured emissions of Cr(VI) from thermal spraying facilities, indicating that some chromium

conversion occurs during the spray process.⁶ This conversion was quantified in a 2004 California Air Resources Board study that surveyed existing research and sponsored studies to develop emission estimation methods for thermal spraying.⁷ An excerpt of the study is attached in Section 3.3 and includes a summary table (Table C-3) of emission factors for Cr(VI) emissions based on the amount of chromium in the process feed. The uncontrolled emission factor for the plasma spray process is 0.0118 pounds Cr(VI) per pound of chromium sprayed. This factor is used to estimate Cr(VI) emissions from the R&D Room. To ensure Cr(VI) compliance with air quality standards, chromium feed to the R&D Room is proposed to be limited to 500 pounds per year.

To ensure compliance with PM₁₀ standards, total coatings in the R&D Room are limited to 1000 lbs/day and 5000 lb/year. Controlled hourly and annual PM₁₀ emissions from the R&D Room are calculated based on these proposed permit feed limits and the certified control efficiency of 99.99 wt%. Based on this control efficiency, the controlled PM₁₀ emission rates are 0.0029 pounds per hour and 0.00018 tons per year.

⁶ "Appendix C: Methodology for Estimating Hexavalent Chromium Emissions from Thermal Spraying," California Air Resources Board, www.arb.ca.gov/regact/thermspr/appc.doc.

⁷ Ibid.

Table 3-4: STS Area Emissions- Research and Development Room

GBU Source: PLRD (PLFARR1)	R&D Parts Coating	Common Name	Content	CAS Number	Content Conc. (wt% per MSDS)	Application Device
		Aluminum Wire	Aluminum	7429-90-5	100%	Praxair BP400
			Chromium	7440-47-3	0.03%	
		Manganese Cobalt Spinel	Mn Oxide	1317-35-7	50%	Praxair SG100
			Co Oxide	1308-06-1	50%	
		Moly Wire	Molybdenum	7439-98-7	100%	SmartArc
		Moly Powder	Molybdenum	7439-98-7	100%	Praxair SG100
		Nickel Powder	Nickel	7440-02-0	100%	Praxair SG100
			Nickel	7440-02-0	83%	
			Chromium	7440-47-3	10%	
			Silicon	7440-21-3	2.5%	
			Boron	7440-42-8	2.0%	
			Iron	7439-89-6	2.0%	
		Ni Moly Al Powder	Nickel	7440-02-0	75%	Praxair SG100
			Molybdenum	7439-98-7	20%	
			Aluminum	7429-90-5	20%	
		Silicon Powder	Silicon	7440-21-3	100%	Praxair SG100
		Titanium Powder	Titanium	7440-32-6	99%	Praxair SG100

Notes:

- Feed restrictions used in R&D Room for multiple TAPs in multiple coatings but used in small quantities (typically a few pounds of coating per day). Proposed permit emission limits are based on 100 lbs/day of individual 585 TAP metals in feed (AAC \geq 0.0025 mg/m³), and 200 lbs/yr of 586 TAP metals in feed (AAC \geq 4.2E-03 ug/m³). Chromium limited to 500 lbs per year in feed, to limit potential Cr(VI) emissions. Total R&D coatings (PM contributors) limited to 1000 lbs/day and 5000 lbs/yr.
- Estimated retention based on NxEdge testing of Si and TiO_x powders. Typical wire DE \geq 50%. See Table2 3-1B, 3-2, and 3-3B.
- Cyclone efficiency (pre-filter) estimated at 80%, but no certification data available so cyclone emission control not included. For FARR filters, cartridge filter efficiency is certified at 99.99% for particle sizes of 0.5 micron and larger.
- Conversion of chromium to hexavalent chromium in plasma spray process is 0.0118 lb Cr(VI) generated per lb of Cr in feed (source: CA EPA Air Resources Board). Proposed Cr(VI) emission limit based on 500 lbs/year of Cr feed.

EMISSION CALCULATIONS WITH RESTRICTED FEED RATES (Note 1)															
GBU Source: PLRD (PLFARR1)	R&D Parts Coating	Component	Conc. Used for Annual calcs (wt%)	Form in Coating (typical)	Application Device	Component Restricted Daily Use (lbs) ^{Note 1}	Coating Restricted Annual Use (lbs) ^{Note 1}	Coating Retention on Target (%) ^{Note 2}	FARR1 Cyclone & Filter Unit	Control Equipment Efficiency (%) ^{Note 3}	Controlled 24 hr Avgd Emissions (lb/hr)	585 TAP Screening Level (lb/hr)	Controlled Annual Avg Emissions (lb/hr)	586 TAP Screening Level (lb/hr)	Controlled Annual Emissions (lb/yr)
		Aluminum	100%	powder, wire	Praxair BP400 Praxair SG100	100	4800	30%	FARR1	99.99%	0.00029	0.667	3.84E-05	—	0.336
		Boron	100%	powder	Praxair SG100	100					0.00029	non-TAP		—	
		Chromium	10.5%	powder	Praxair SG100	100					0.00029	0.033		—	
		Cobalt	100%	powder	Praxair SG100	100					0.00029	0.0033		—	
		Iron	100%	powder	Praxair SG100	100					0.00029	non-TAP		—	
		Manganese	100%	powder	Praxair SG100	100					0.00029	0.333		—	
		Molybdenum	100%	powder, wire	Praxair SG100 SmartArc	100					0.00029	0.667		—	
		Silicon	100%	powder	Praxair SG100	100					0.00029	0.667		—	
		Titanium	100%	powder	Praxair SG100	100					0.00029	non-TAP		—	
		Nickel	100%	powder	Praxair SG100	100	200	30%	99.99%	0.00029	—	1.60E-06	2.7E-05	0.014	
		Chromium (VI)	0%	Generated from 500 lbs per year of Cr in feed (Notes 1, 4)					0%	99.99%	—	—	6.79E-08	5.60E-07	0.00059

Criteria Pollutants Emissions Summary	Coating R&D Room	PM ₁₀ Significant Emission Rate (tons/yr)	Uncontrolled Annual Emissions		Controlled Hourly Emissions		Controlled Annual Emissions			
			Current Permit (ton/yr)	Proposed Mod. (ton/yr)	Current Permit (lb/hr)	Proposed Mod. (lb/hr)	Current Permit (ton/yr)	Proposed Mod. (ton/yr)	Emission Change, ton/yr	Change, % of Significant
			PM ₁₀ (Note 1)	15	21.8	N/A	0.024	0.0029	0.042	0.00018

Toxic Air Pollutants Emissions Summary	Coating R&D Room	TAP Type (24 hr or Annual Avgd EL)	TAP Screening Emission Level (lb/hr)	Controlled Hourly Emissions			Controlled Emissions, % of EL
				Current Permit (lb/hr)	Proposed Mod. (lb/hr)	Proposed Mod. (lb/hr)	
	Aluminum	585 (24 hr)	0.667	0.01330	2.9E-04	0.34	0.04%
	Cadmium	586 (Annl)	3.7E-06	8.37E-09	0	0.34	0%
	Chromium	585 (24 hr)	0.033	3.58E-06	2.9E-04	0.035	0.9%
	Chromium (VI)	586 (Annl)	5.6E-07	0	6.8E-08	5.9E-04	12.1%
	Cobalt	585 (24 hr)	0.0033	0	2.9E-04	0.34	8.8%
	Copper	585 (24 hr)	0.067	3.18E-06	0	0.34	0%
	Manganese	585 (24 hr)	0.333	3.58E-07	2.9E-04	0.34	0.09%
	Molybdenum	585 (24 hr)	0.667	5.00E-07	2.9E-04	0.34	0.04%
	Nickel	586 (Annl)	2.7E-05	1.93E-05	1.6E-06	0.01	5.9%
	Silicon	585 (24 hr)	0.667	0.0087	2.9E-04	0.34	0.04%
	Tin	585 (24 hr)	0.133	0.00087	0	0.34	0%
	Yttrium	585 (24 hr)	0.067	0.00058	0	0.34	0%
	Zinc	585 (24 hr)	0.667	0.00042	0	0.34	0%

Hazardous Pollutants Emissions Summary	R&D Room	Controlled Emissions (tons/yr)
	Chromium	1.8E-05
	Cobalt	1.7E-04
	Manganese	1.7E-04
	Nickel	7.0E-06
Total =		3.6E-04

**Dependable
and consistent**

Reliability

Designed with reliability, robustness and flexibility in mind, the BP-400 can handle a variety of applications without compromising coating quality. Lightweight, portable and easy to use, the BP-400 offers one-touch, point-and-shoot operation. Based on a highly engineered "push" wire delivery system, the BP-400 virtually eliminates drive mechanism maintenance. This leads to lightweight gun design, fewer worries, and reliable operation.

BP-400 features

- "Push" wire feed design
- Lightweight gun with no moving parts
- Synchronous dual wire feeding
- 350-amp 100% duty cycle power supply
- Handheld or machine mounted

Simple to operate yet robust, the BP-400 arc spray system produces high-quality metallic coatings.



Offering all the benefits of the other arc spray models plus much more, the 9935 gun when used with the CoArc™ system provide modularity, and robustness. Advanced controls make the CoArc system the ultimate in flexibility and ease-of-use. The CoArc system has the option of supplying the wire with "push/pull" technology and when combined with the optional closed-loop control of gun head's voltage and air pressure, truly revolutionizing the arc spray process to ensure consistent, reproducible coating quality.

CoArc system features

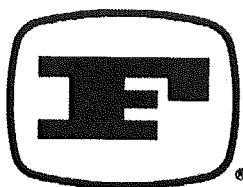
- Touch-screen operator interface
- Monitoring of spray head voltage and air pressure
- Recipe storage
- Simple, modular design
- Advanced power supply



The flexibility of the BP-400 is such that it can function in hand-held or fully automated configurations in applications such as spraying varistors.



The CoArc system is designed for automated spraying yet offers optional hand spraying capability. The 9935 gun incorporates high-flow air design that when combined with the optional closed-loop control feature ensures consistent, reproducible coating quality.

**FARR**

Air Pollution Control

Emissions Performance Statement For NxEdge Inc of Boise

Qty 1 Gold Series Filter Dust Collector
Material Filtered: Aluminum Oxide (Thermal Spray)
AC ratio: Not to exceed 2.5:1
Inlet Grain Loading: Not to exceed 10 grains per DSCF

Farr Company warranties that the emissions from the GS20 Dust Collector utilizing DuraPleat Filter Model – DPT-200, Part Number - 205637004 (Spun Bond / Polyester PTFE Membrane) will not exceed 0.002 gr/dscf in particulate emissions for one year from startup and it is expected that the emissions should be below 0.001 gr/dscf.

Farr Company also warranties these filters will provide an efficiency of 99.99% on .5 micron particles (by weight) if operated under normal conditions and a 2.0" w.g. or higher of differential pressure is maintained.

If a verification stack test is to be performed, it must be done at least 30 days after startup, and no more than 90 days after startup. If emissions level is not met, then Farr will be responsible for supplying a higher efficiency filter media to meet emissions level. Farr requests proper notification for any stack test in order to be present at the test. Farr will not be responsible for the costs associated with any stack tests.

The following conditions will apply to this warranty:

- (1) The collectors will be operated per industry standard practices, (Reference Collector Operating Instruction Manual)
- (2) Upset conditions, as defined as excessive oil or hydrocarbons, loss of power to the cleaning system, excessive moisture, abrasion due to improper evacuation of dust collector hopper or exceeding air flow specified, may void this warranty.
- (3) Review of inlet duct design by Farr Company.
- (4) Daily records will be kept on pressure drop across the filters.
- (5) Under no circumstances will Farr Company be responsible for incidental or consequential damages.

Lee Morgan
President

MATERIAL SAFETY DATA SHEET

For Coatings, Resins and Related Materials

01T - Aluminum Wire

PS# T109

Page 1 of 5

Section 1 - Identification of the Substance/Preparation and the Company

01T - Aluminum Wire

PS# T109

Monday, January 30, 2006

TAFE Incorporated

A Praxair Surface Technologies Company

146 Pembroke Road

Concord, NH 03301

USA

Phone:

(603) 224-9585

Mon-Fri**In Case of Emergency:**

(603) 224-9585

7:00-3:30**Chemtec:**

800/424-9300

USA**Section 2 - Composition/Information on Ingredients**

Chromium

weight %:

.03

CAS No.:

7440-47-3

Index No.:

n/a

Hazards:

Xn - Harmful

Risks:

40/20 - Possibility of irreversible effects - inhalation

40/22 - Possibility of irreversible effects - ingestion

Aluminum

weight %:

100

CAS No.:

7429-90-5

Index No.:

n/a

Hazards:

Xn - Harmful

Risks:

20 - Harmful by inhalation

7440-47-3

(Chromium)

ACGIH/TLV:

0.5 mg/m3

OSHA/PEL: 0.5 mg/m3

7429-90-5

(Aluminum)

ACGIH/TLV:

10 mg/m3

OSHA/PEL: 15 mg/m3**Section 3 - Hazards Identification**

Aluminum spray arc wire is generally not considered hazardous in the form shipped (wire), However, small chips, fine turnings and dust from processing may ignite readily. Explosion/fire hazards may be present when 1.) Dust or fines are dispersed in air. 2.) Fines or dust are in

MATERIAL SAFETY DATA SHEET**Section I. Chemical Product and Company Identification**

Product Name	Manganese Cobalt Spinel
Product Code	(Mn,Co)3 O4
CAS Number	Mixture
Manufacturer's Name	NexTech Materials, Ltd.
Address	404 Enterprise Drive Lewis Center, OH 43035
Information Telephone Number	614-842-6606
Date Prepared	August 31, 2007

Section II. Composition / Information on Ingredients

Component	CAS #	% (Optional)
Manganese oxide	1317-35-7	
Cobalt oxide	1308-06-1	

Section III. Hazards Identification

- ♦ Hazard description: Irritant, harmful
- ♦ Information pertaining to particular dangers for man and environment
 - Harmful if swallowed
 - May cause sensitization by skin contact
 - Irritating to eyes, respiratory system and skin.
 - Harmful by inhalation, in contact with skin and if swallowed.

Section IV. First Aid Measures

- ♦ **After inhalation**
 - Supply fresh air. If required, provide artificial respiration. Keep patient warm.
 - Seek immediate medical advice.
- ♦ **After skin contact**
 - Immediately wash with water and soap and rinse thoroughly. Remove affected clothing.
 - Seek immediate medical advice.
- ♦ **After eye contact**
 - Rinse opened eye for several minutes under running water. Then consult a doctor.
- ♦ **After swallowing**
 - Seek immediate medical advice.

Section V. Fire Fighting Measures

- ♦ **Suitable extinguishing agents**
 - Product is not flammable. Use fire-fighting measures that suit the surrounding fire.
- ♦ **Protective equipment:**
 - Wear self-contained respirator.
 - Wear fully protective impervious suit.

Section VI. Accidental Release Measures

- ♦ **Special hazards caused by the material, its products of combustion or resulting gases:**
 - Exothermic reaction with water may occur.
- ♦ **Protective equipment:**
 - Wear self-contained respirator.
 - Wear fully protective impervious suit.

Section VII. Handling and Storage

- ♦ **Handling**
- ♦ **Information for safe handling:**
 - Keep container tightly sealed.
 - Store in cool, dry place in tightly closed containers.
 - Ensure good ventilation at the workplace.

MATERIAL SAFETY DATA SHEET

For Coatings, Resins and Related Materials

13T - Molybdenum

PS# T134

Page 1 of 4

Section 1 - Identification of the Substance/Preparation and the Company

13T - Molybdenum

PS# T134

Monday, January 30, 2006

TAF A Incorporated

A Praxair Surface Technologies Company

146 Pembroke Road

Concord, NH 03301

USA

Phone:

(603) 224-9585

Mon-Fri**In Case of Emergency:**

(603) 224-9585

7:00-3:30**Chemtrec:**

800/424-9300

USA**Section 2 - Composition/Information on Ingredients**

Molybdenum

weight %:

100

CAS No.:

7439-98-7

Index No.:

n/a

Hazards:

Xn - Harmful

Risks:

20 - Harmful by inhalation

22 - Harmful by ingestion

7439-98-7

(Molybdenum)

ACGIH/TLV:

10 mg/m3

OSHA/PEL: 15 mg/m3**Section 3 - Hazards Identification**

Spray arc wire is generally not considered hazardous in the form shipped (wire), However, if your process involves grinding, melting, welding cutting or any other process that causes release of dust or fume, hazardous levels of dust or fume of the constituents of this alloy could be generated

Section 4 - First-Aid Measures

As shipped this material is an article. The likelihood for hazardous consequences through eye or skin contact, inhalation or ingestion would be considered minimal. **INHALATION:** Remove person from exposure to fresh air. If breathing difficulty occurs, get prompt medical attention. **SKIN/EYE CONTACT:** Flush eye with plenty of water for 15 minutes, seek medical attention if irritation persists. Wash skin with soap and water, if rash develops, seek medical attention.

The hazards of this material are mainly due to its sensitizing and mild irritating properties. There is no specific antidote. Treatment of overexposure should be directed at the control of symptoms and the clinical condition.

NxEdge PTC Modification

STS Area MSDS
Molybdenum Powder**MATERIAL SAFETY DATA SHEET****SECTION 1 - PRODUCT IDENTIFICATION****PRODUCT NAME:** Molybdenum Powder**SUPPLIER'S NAME AND ADDRESS:**HAI Advanced Material Specialists
9230 Norwalk Blvd.
Santa Fe Springs, CA 90670**TELEPHONE/BUSINESS:** 562-463-8133
FAX: 562-463-8143

Material or Component	CAS Number	% By Weight	OSHA P.E.L.
MOLYBDENUM	7439-98-7	>99.0	15.0

* = CHEMICALS LISTED AS A POSSIBLE CARCINOGEN N.E. = NOT ESTABLISHED

CHEMICAL AND PHYSICAL PROPERTIES

Boiling Point:	N/A
Melting Point:	3,920°F
Solubility in water:	Insoluble
% volatile (vol.):	N/A
Specific gravity (water=1):	10.2
Vapor pressure (mmHg):	N/A
Evaporation rate:	N/A
pH:	N/A
Appearance and odor:	DARK GREY POWDER, ODERLESS
Other:	None

FIRE AND EXPLOSION HAZARDS

Flash point (method):	N/A
Auto ignition temp.:	N/A
Flammable limits:	N/A

Special fire fighting procedures: Cover gently with extinguishing agent and allow to cool and gradually burn itself out.**Unusual fire and explosion hazards:** Fire risk is low but like other finely divided metals, material can be ignited and will burn.**ACUTE HEALTH EFFECTS/ROUTES OF ENTRY**

Both the NPT and OSHA (CFR 1910.1200 (d)(4)(i)) list nickel as a possible cancer hazard, while IARC found limited evidence regarding nickel carcinogenicity to humans. Nickel dust may cause asthma in sensitive individuals. Chromium dust may cause laryngitis and bronchitis. Molybdenum may cause cumulative liver and kidney damage as well as blood disorders.

Inhalation: May cause irritation of the nose, throat, and respiratory tract. Excessive acute exposure may result in metal fume fever with flu like symptoms.**Skin contact:** Repeated exposure to dust may cause allergic skin reactions. Exposure may cause skin ulcers.**Eye contact:** Dust is not likely to cause problems while ingestion of dust may cause conjunctivitis.**Ingestion:** Dust is not likely to cause problems while ingestion of chromium, nickel, and molybdenum may cause nausea, duodenal ulcer and colitis.

Material Safety Data Sheet

**METCO 56C, 56C-NS, 56F-NS,
XP 1104, XP 1105, SPM 4-2358**

MSDS No.: 50-120
Revision No.: 8
Revision Date: October 8, 1998
Original Date of Issue: September 7, 1987
 (ELECTRONIC FORMAT)

SECTION I MATERIAL IDENTIFICATION

Other Designation: FINE NICKEL POWDER

SECTION II COMPOSITION AND TOXICITY

Composition	%	CAS#	OSHA PEL	ACGIH TLV	Toxicity
Nickel * +	Min. 99.5	7440-02-0	1 mg/m ³ TWA	1 mg/m ³ TWA	

N/A – Not Available, Not Applicable. NE – Not Established.

Material Safety Data Sheet

SULZER**Sulzer Metco****Section 1. Chemical Product and Company Identification**

Product name Metco 12C, Sulzer Metco 4746, Sulzer Metco 7012, ROH 12301, XPT-D 661, XPT 595
Supplier **SULZER METCO (US) INC.**
1101 Prospect Avenue
Westbury, NY 11590-0201
Phone: (516) 334-1300
Emergency Phone: CHEMTREC 800-424-9300
Calls Outside the United States: 202-483-7616
Material Uses Metal industry: Used by Spraying

Section 2. Composition, Information on Ingredients

Name	CAS #	% by Weight	Exposure Limits
Nickel	7440-02-0	83	ACGIH (United States, 2002). TWA: 1.5 mg/m ³ NIOSH REL (United States, 2001). TWA: 0.01 mg/m ³ Period: 10 hour(s). OSHA PEL 1989 (United States, 1989). TWA: 1 mg/m ³
Chromium	7440-47-3	10	ACGIH TLV (United States, 2002). TWA: 0.5 mg/m ³ Form: Inorganic TWA: 0.01 mg/m ³ Form: Insoluble TWA: 0.05 mg/m ³ Form: Soluble NIOSH REL (United States, 2001). TWA: 0.5 mg/m ³ Period: 10 hour(s). OSHA PEL 1989 (United States, 1989). TWA: 1 mg/m ³
Silicon	7440-21-3	2.5	ACGIH TLV (United States, 2002). TWA: 10 mg/m ³ NIOSH REL (United States, 2001). TWA: 10 mg/m ³ Period: 10 hour(s). OSHA PEL 1989 (United States, 1989). TWA: 5 mg/m ³ TWA: 10 mg/m ³
Boron	7440-42-8	2	Not available.
Iron	7439-89-6	2	Not available.
Cobalt	7440-48-4	0.5	ACGIH TLV (United States, 2002). TWA: 0.02 mg/m ³ NIOSH REL (United States, 2001). TWA: 0.05 mg/m ³ Period: 10 hour(s). OSHA PEL 1989 (United States, 1989). TWA: 0.05 mg/m ³

Section 3. Hazards Identification

Physical State and Appearance Powder

Emergency Overview WARNING!
CANCER HAZARD
CONTAINS MATERIAL WHICH CAN CAUSE CANCER
CONTAINS MATERIAL WHICH CAUSES DAMAGE TO THE FOLLOWING ORGANS: LUNGS,
RESPIRATORY TRACT, SKIN, EYE, LENS OR CORNEA, NOSE, SINUSES.
MAY BE HARMFUL IF SWALLOWED.
MAY CAUSE ALLERGIC RESPIRATORY AND SKIN REACTION.

METCO12C

Date of issue 7/17/2003

Print Date

7/24/2003

MSDS#

50-100

Prepared by

Sulzer Metco (US) Inc.

MATERIAL SAFETY DATA SHEET

For Coatings, Resins and Related Materials

Ni-453

PS# 036123-10

Page 1 of 5

Section 1 - Identification of the Substance/Preparation and the Company

Ni-453

PS# 036123-10

Monday, May 05, 2003

Praxair Surface Technologies, Inc.
Specialty Products Business
1555 Main Street
Indianapolis, IN 46224
USA

Phone:

317/240-2650

Mon-Fri**In Case of Emergency:**

317/240-2187

7:00-3:30**Chemtrec:**

800/424-9300

USA**Section 2 - Composition/Information on Ingredients**

Nickel

weight %:

>75

CAS No.:

7440-02-0

Index No.:

n/a

Hazards:

Xn - Harmful

Risks:

- 40/20 - Possibility of irreversible effects - inhalation
- 40/22 - Possibility of irreversible effects - ingestion
- 42 - May cause sensitization by inhalation
- 43 - May cause sensitization by skin contact

Molybdenum

weight %:

5-20

CAS No.:

7439-98-7

Index No.:

n/a

Hazards:

Xn - Harmful

Risks:

- 20 - Harmful by inhalation
- 22 - Harmful by ingestion

Ni-453

PS# 036123-10

Page 2 of 5

Aluminum

weight %: 5-20
CAS No.: 7429-90-5
Index No.: n/a

Hazards:

Xn - Harmful

Risks:

20 - Harmful by inhalation

7440-02-0	(Nickel)	
ACGIH/TLV:	0.2 mg/m3	OSHA/PEL: 1 mg/m3
7439-98-7	(Molybdenum)	
ACGIH/TLV:	10 mg/m3	OSHA/PEL: 10 mg/m3
7429-90-5	(Aluminum)	
ACGIH/TLV:	10 mg/m3	OSHA/PEL: 15 mg/m3

Section 3 - Hazards Identification

Nickel has been determined to cause cancer in experimental animals (IARC, NTP). Nickel is listed as a probable human carcinogen. Chronic eczema/neurodermatitis from Nickel does not require continuous metal contact. SKIN CONTACT: May cause allergic dermatitis in susceptible individuals, which usually occurs in the folds of the skin. EYE CONTACT: May cause irritation, experienced as redness of the conjunctiva. SWALLOWING: May cause nausea, abdominal pain, vomiting and diarrhea. INHALATION: May cause respiratory tract irritation, with chest pain, vomiting and diarrhea. May also cause interstitial pneumonitis and sensitization of the respiratory tract in susceptible individuals. Breathing of dust may aggravate asthma and inflammatory or fibrotic pulmonary disease with overexposure.

Section 4 - First-Aid Measures

In case of SKIN contact wash thoroughly with soap and water. If contact with EYE occurs, flush thoroughly with plenty of water. If discomfort persists, seek medical attention. If INHALED, remove to fresh air and give artificial respiration if not breathing. Oxygen may be given if necessary. Call a physician. If SWALLOWED, give at least 2 glasses of milk or water. Induce vomiting unless patient is unconscious. Call a physician.

The hazards of this material are mainly due to its sensitizing and mild irritating properties. There is no specific antidote. Treatment of overexposure should be directed at the control of symptoms and the clinical condition.

Section 5 - Fire-Fighting Measures

Use special dry powder metal extinguishing material to extinguish metal fires. Use appropriate extinguisher to extinguish combustible materials that may be ignited by the thermal spray flame. (Water is not recommended for metal fires or around electrical equipment.)

Section 6 - Accidental Release Measures

Wear protective equipment to protect against hazards such as over exposure to skin, eyes and

Stanford Materials Corporation

SERIAL NUMBER: **ME14P-001**

PAGE 1 OF 4

REVISED May 22, 2006

MATERIAL SAFETY DATA SHEET

This form may be used to comply with OSHA's Hazard Communication Standard, 29 CFR 1910.1200.

IDENTITY (As Used on Label and List): **SILICON, POWDERS AND PIECES**

SECTION I - PRODUCT IDENTIFICATION

Silicon, powder and pieces

Product Details: Silicon powders and pieces

Stock Number: ME14P

Manufacturer/Supplier:

Stanford Materials Corporation

4 Meadowpoint, Aliso Viejo, CA 92656, USA

Tel: (949) 362-1746, Fax: (949) 362-1810

<http://www.stanfordmaterials.com>UPC/EAN: 231-130-8SYNONYMS SiliconCHEMICAL FAMILY: Non-metalDOT HAZARD LABEL: No data.FORMULA: SiMOLECULAR WEIGHT: 28.09

SECTION II - HAZARDOUS INGREDIENTS/IDENTITY INFORMATION

Silicon, powder and pieces

HAZARDOUS COMPONENTS (CHEMICAL NAME)

<u>NAME:</u>	Silicon		
<u>CAS #:</u>	7440-21-3	<u>PERCENTAGE:</u>	0.0 -100.0 %
<u>OSHA PEL:</u>	15 mg/m3	<u>ACGIH TLV:</u>	10 mg/m3
<u>OTHER LIMITS:</u>	5mg/m3 resp		
<u>SEC.302 (EHS):</u>	No	<u>SEC.304 RQ:</u>	No
<u>SEC.313:</u>	No		

SECTION III - PHYSICAL/CHEMICAL CHARACTERISTICS

Silicon, powder and pieces

<u>PHYSICAL STATES:</u>	<input type="checkbox"/> Gas , <input type="checkbox"/> Liquid , <input checked="" type="checkbox"/> Solid
<u>BOILING POINT:</u>	2355.00 C (4271.0 F) to 2600.00 C (4712.0 F)
<u>MELTING POINT:</u>	1410.00 C (2570.0 F) to 1420.00 C (2588.0 F)
<u>SPECIFIC GRAVITY (WATER = 1):</u>	2.33 gm/cc at 25.0 C (77.0 F)
<u>DENSITY:</u>	No data.
<u>VAPOR PRESSURE (VS. AIR OR MM HG):</u>	1 mm at 1724.0 C (3135.2 F)



MATERIAL SAFETY DATA SHEET

AUG 14, 1992

R Revised Revised Revised 3/25/93, Revised 3/2

Ti-60

SECTION I PRODUCT IDENTIFICATION

MANUFACTURER'S NAME: CRUCIBLE RESEARCH
Div. Crucible Materials Corp.

ADDRESS: 6003 Campbells Run Road
Pittsburgh, PA 15205-1022

EMERGENCY TELEPHONE: (412) 923-2955
FOR FURTHER INFORMATION, CONTACT RICHARD MARTIN

COMMON NAME: Commercially Pure Titanium Powder

TRADE NAME: Commercially Pure Titanium Metal/Powder (Atomized)

CAS NUMBER: N/A

CHEMICAL FAMILY: Metal

SECTION II HAZARDOUS INGREDIENTS

HAZARDOUS INGREDIENTS	CAS NUMBER	%	PEL (OSHA)	TLV (ACGIH)
Titanium	7440-32-6	99	15.0 mg/m ³	10.0 mg/m ³

SECTION III PHYSICAL/CHEMICAL DATA

Boiling Point: 5900°F **Specific Gravity (H₂O = 1):** 4.5 g/cm³

Vapor Pressure (mm Hg.): N/A **Melting Point:** 3020°F

Vapor Density (AIR = 1): N/A **Evaporation Rate (Butyl Acetate = 1):** N/A

Solubility in Water: INSOLUBLE

Appearance and Odor: Gray amorphous metal/powder, odorless